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Supplement of

Ground ice, organic carbon and soluble cations in tundra permafrost soils and sediments near a Laurentide ice divide in the Slave Geological Province, Northwest Territories, Canada

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Contents of supplement

- **Figure S1.** Map of study area
- **Figure S2.** Overview of all boreholes and key quantities from logs and analyses.
- **Figure S3.** Plots of analytical results for each of the 24 individual boreholes (24 pages).

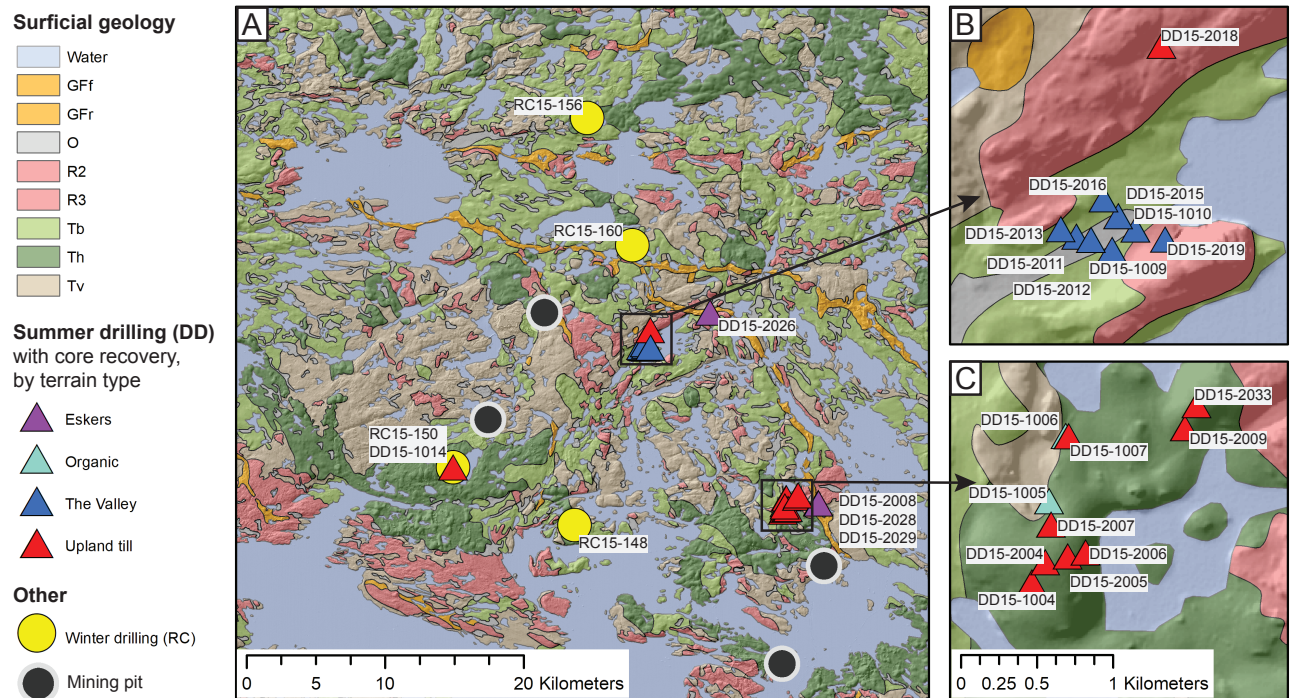
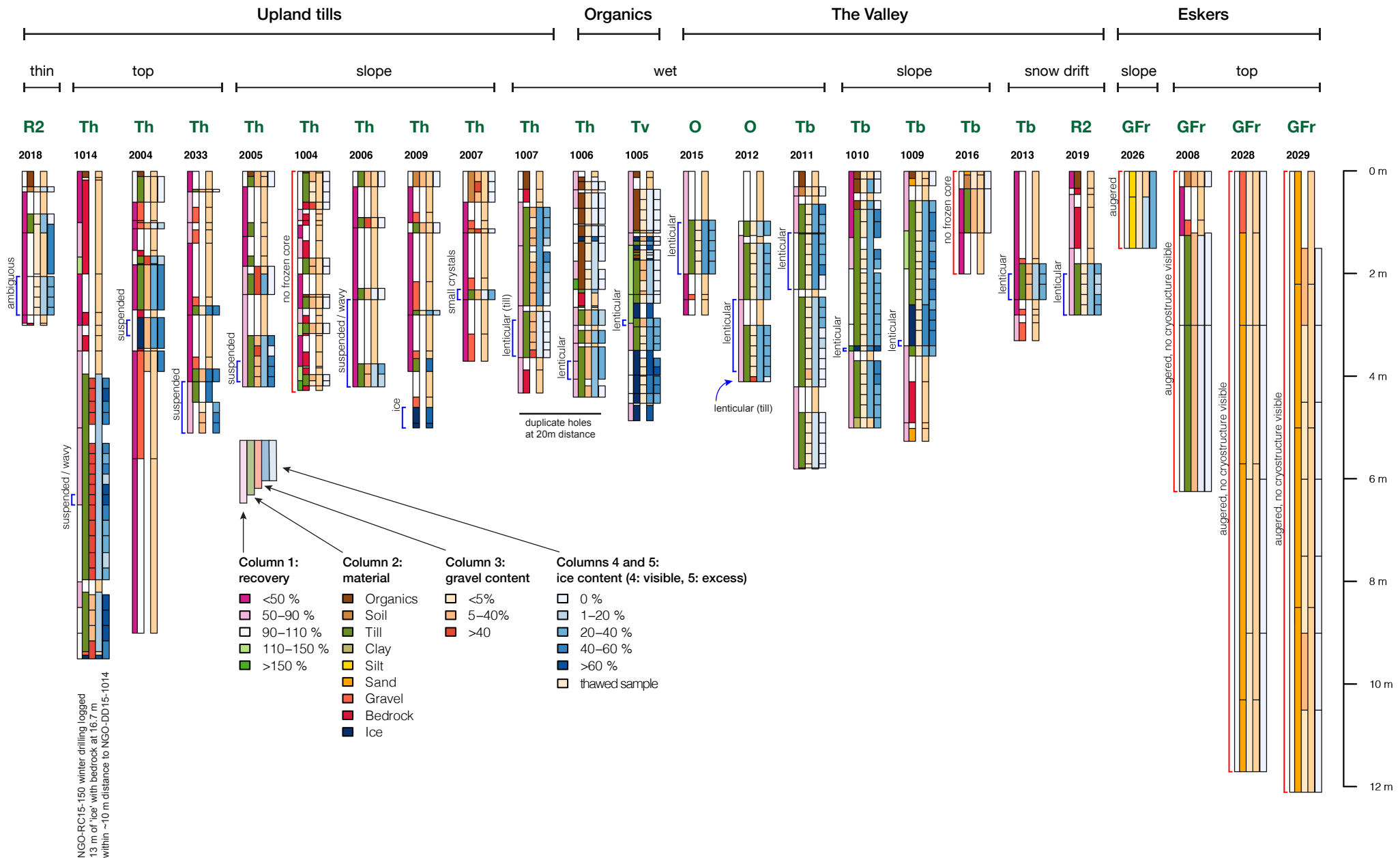


Figure S1. Study area as indicated by the small red box on Figure 1 of the manuscript. The extent (UTM 12N: 497–547 km E, 7,150–7,200 km N) has been chosen arbitrarily with the aim of putting field results into a spatial context while remaining fully inside the 1:125,000 map sheet NTS 76D, for which the surficial geology map ‘Lac de Gras’ is available (Geological Survey of Canada, 2014a).

Figure S2. Overview of boreholes with key quantities from field logs, core photographs and analyses. The top line of grouping shows terrain types used in this study, the line below indicates topographic position or other reason for sampling this location. Below that, green letters indicate the surficial geology class derived from the 1:125,000 NTS 76D map sheet ‘Lac de Gras’. Blue brackets indicate sections with telling cryostructure that is well visible on the polished core photographs and red brackets indicate boreholes without visible cryostructure.



Figures S3 (following 24 pages). Plots of analytical results for individual boreholes. For context the borehole summary from Figure S2 is included on the left of each plot.

Figure S3 (Borehole NGO-DD15-2018). Analytical results [terrain type 'Upland till', sub type 'thin', surficial geology 1:125,000 map unit 'R2']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

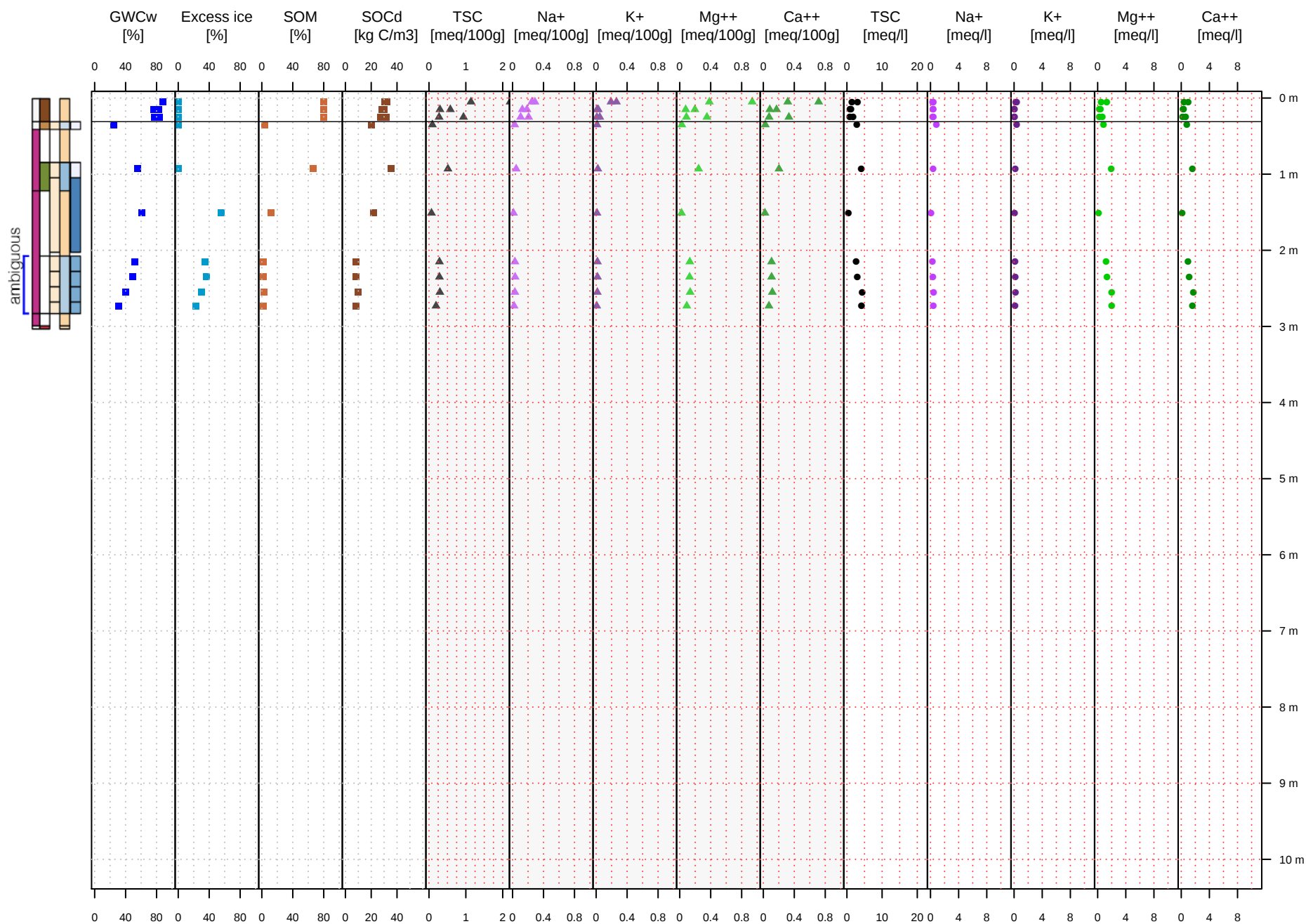


Figure S3 (Borehole NGO-DD15-1014). Analytical results [terrain type 'Upland till', sub type 'top', surficial geology 1:125,000 map unit 'Th']
 Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

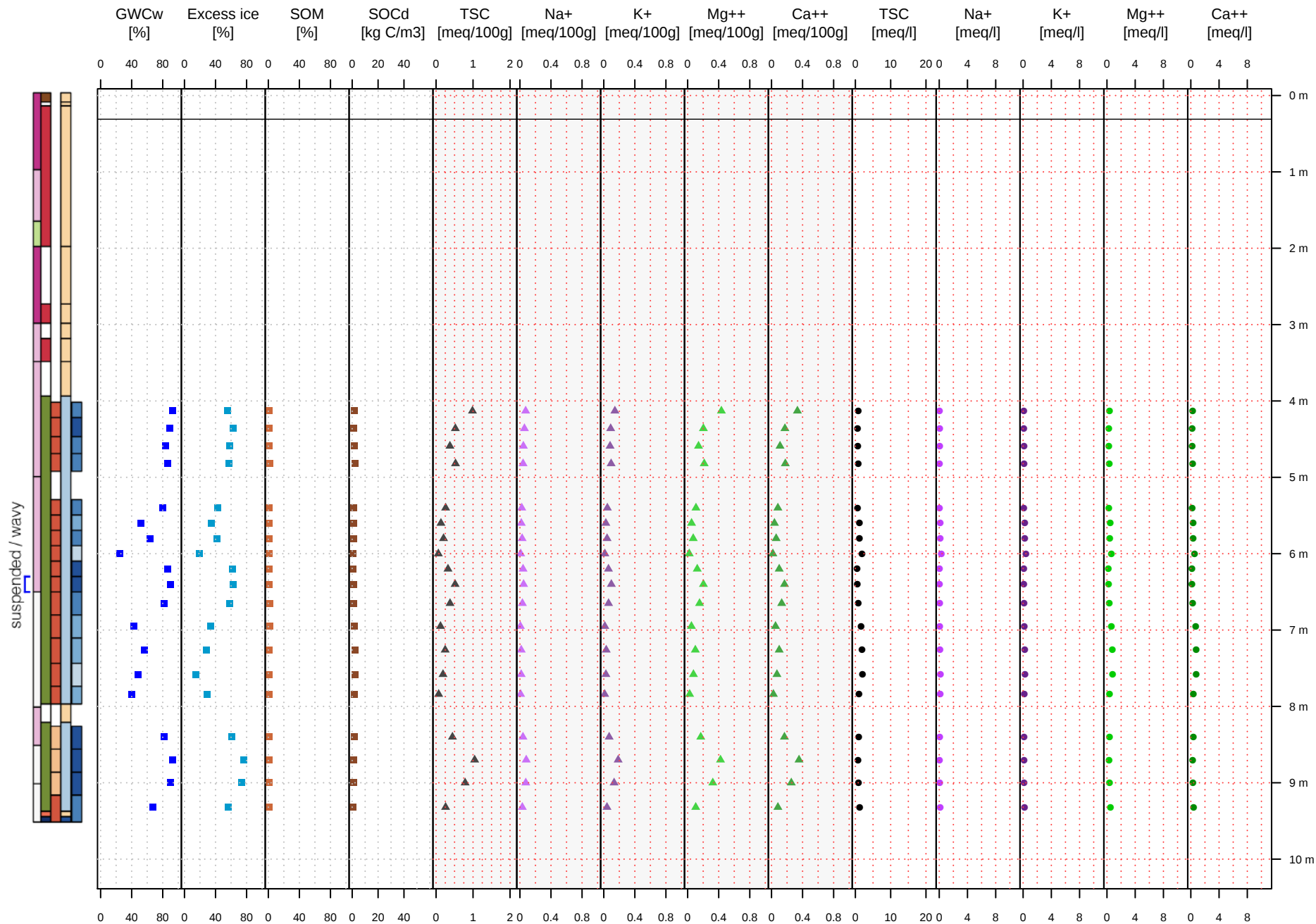


Figure S3 (Borehole NGO-DD15-2004). Analytical results [terrain type 'Upland till', sub type 'top', surficial geology 1:125,000 map unit 'Th']
 Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

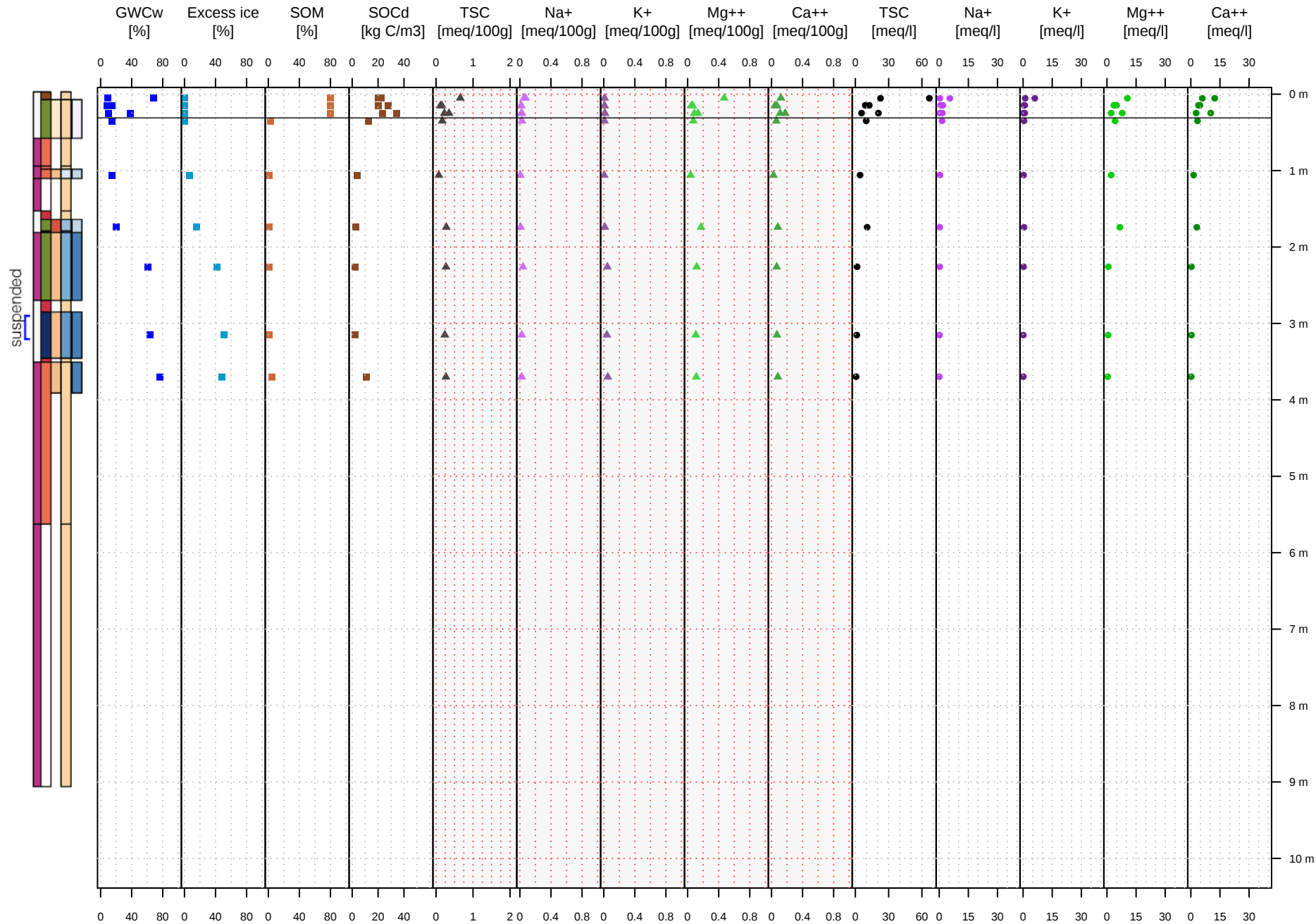


Figure S3 (Borehole NGO-DD15-2033). Analytical results [terrain type 'Upland till', sub type 'top', surficial geology 1:125,000 map unit 'Th']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

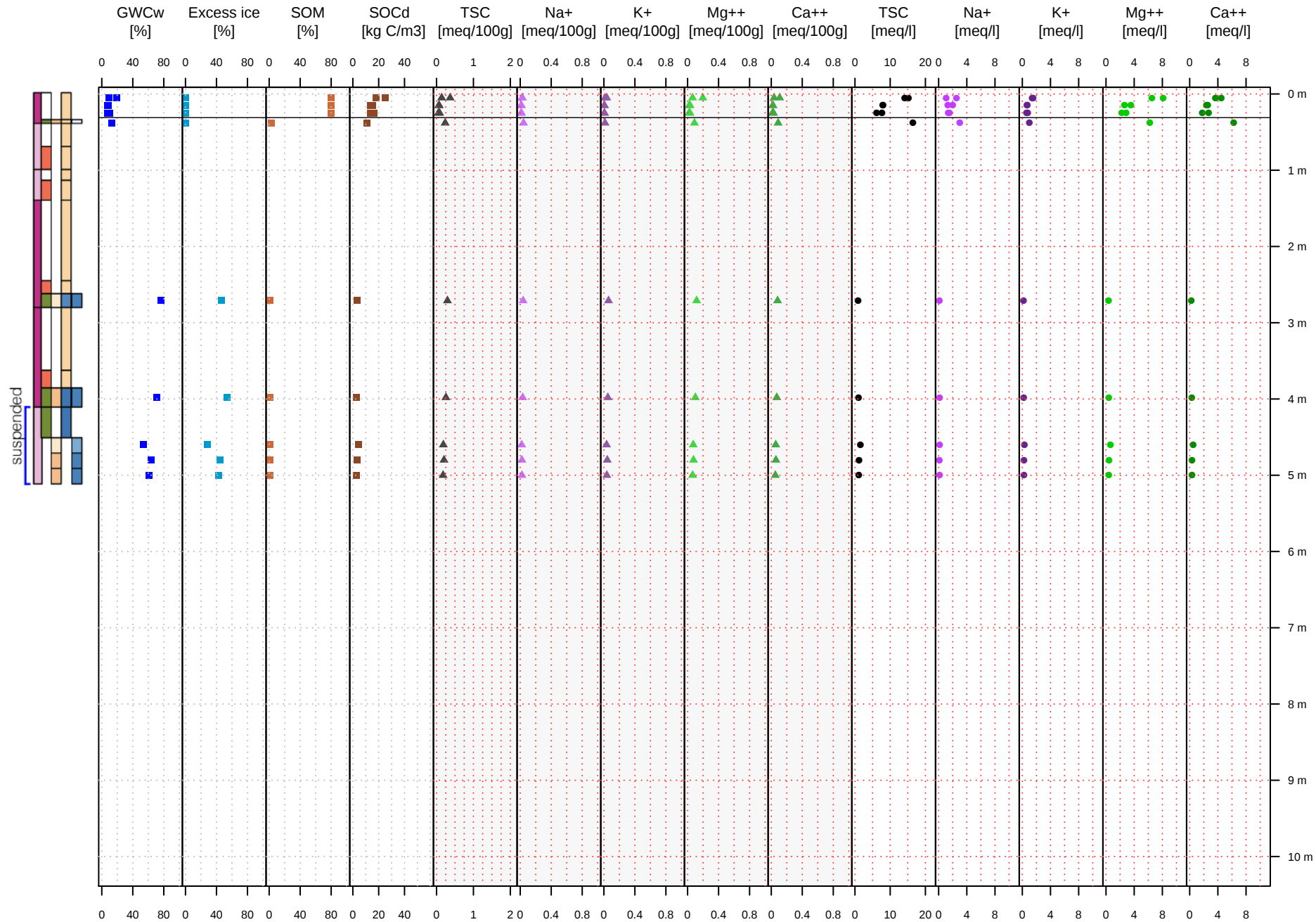


Figure S3 (Borehole NGO-DD15-2005). Analytical results [terrain type 'Upland till', sub type 'slope', surficial geology 1:125,000 map unit 'Th']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

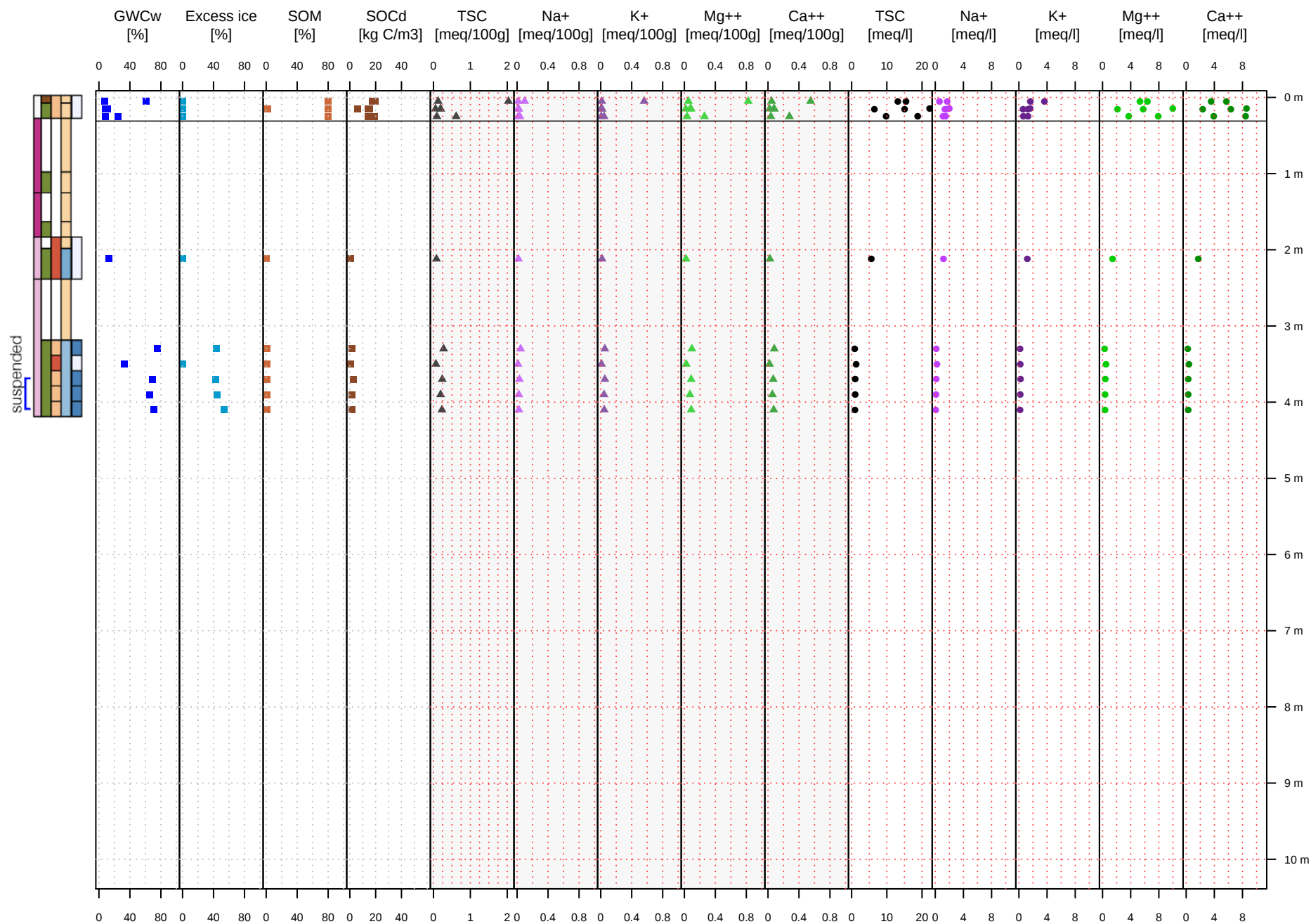


Figure S3 (Borehole NGO-DD15-1004). Analytical results [terrain type 'Upland till', sub type 'slope', surficial geology 1:125,000 map unit 'Th']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

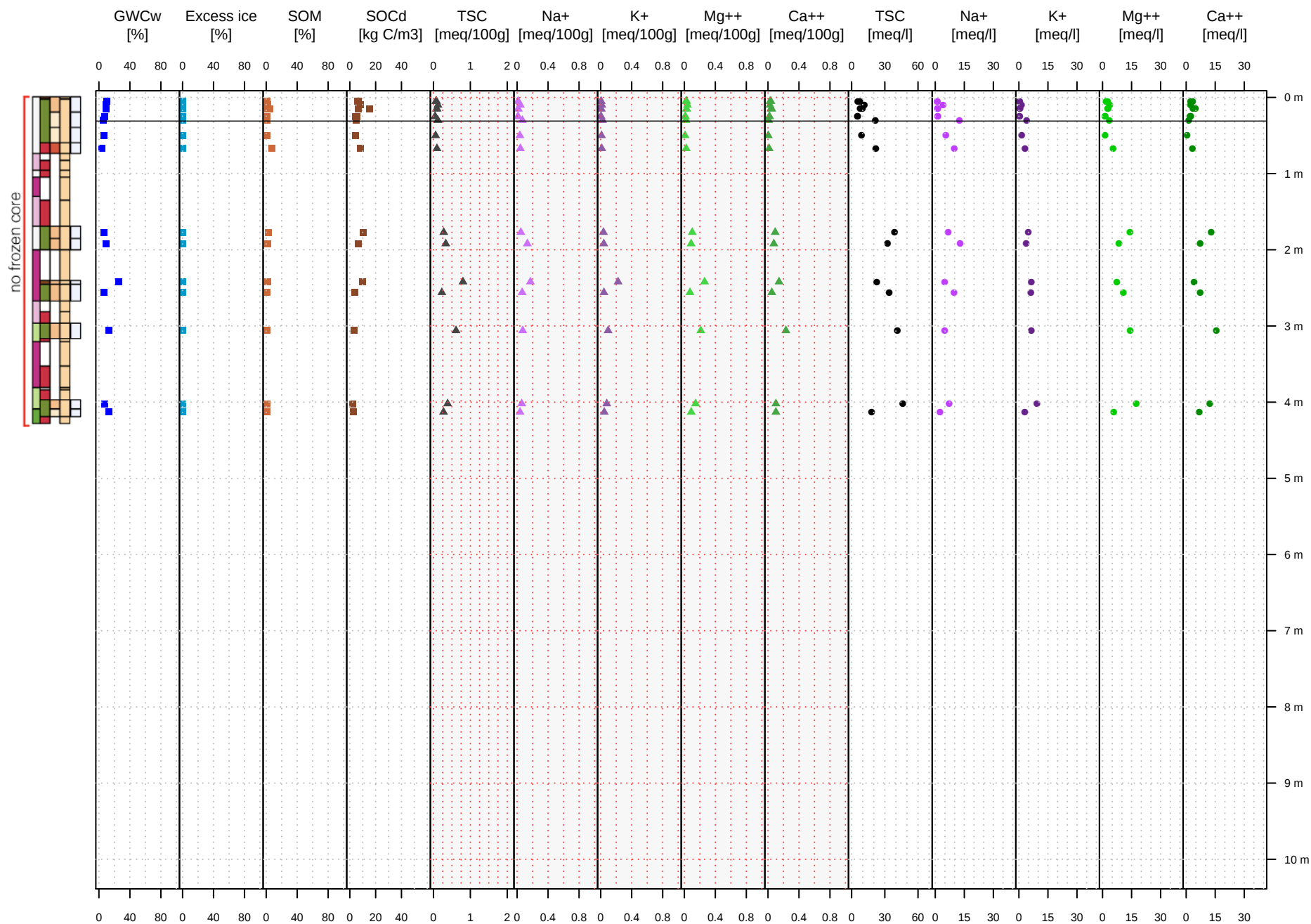


Figure S3 (Borehole NGO-DD15-2006). Analytical results [terrain type 'Upland till', sub type 'slope', surficial geology 1:125,000 map unit 'Th']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

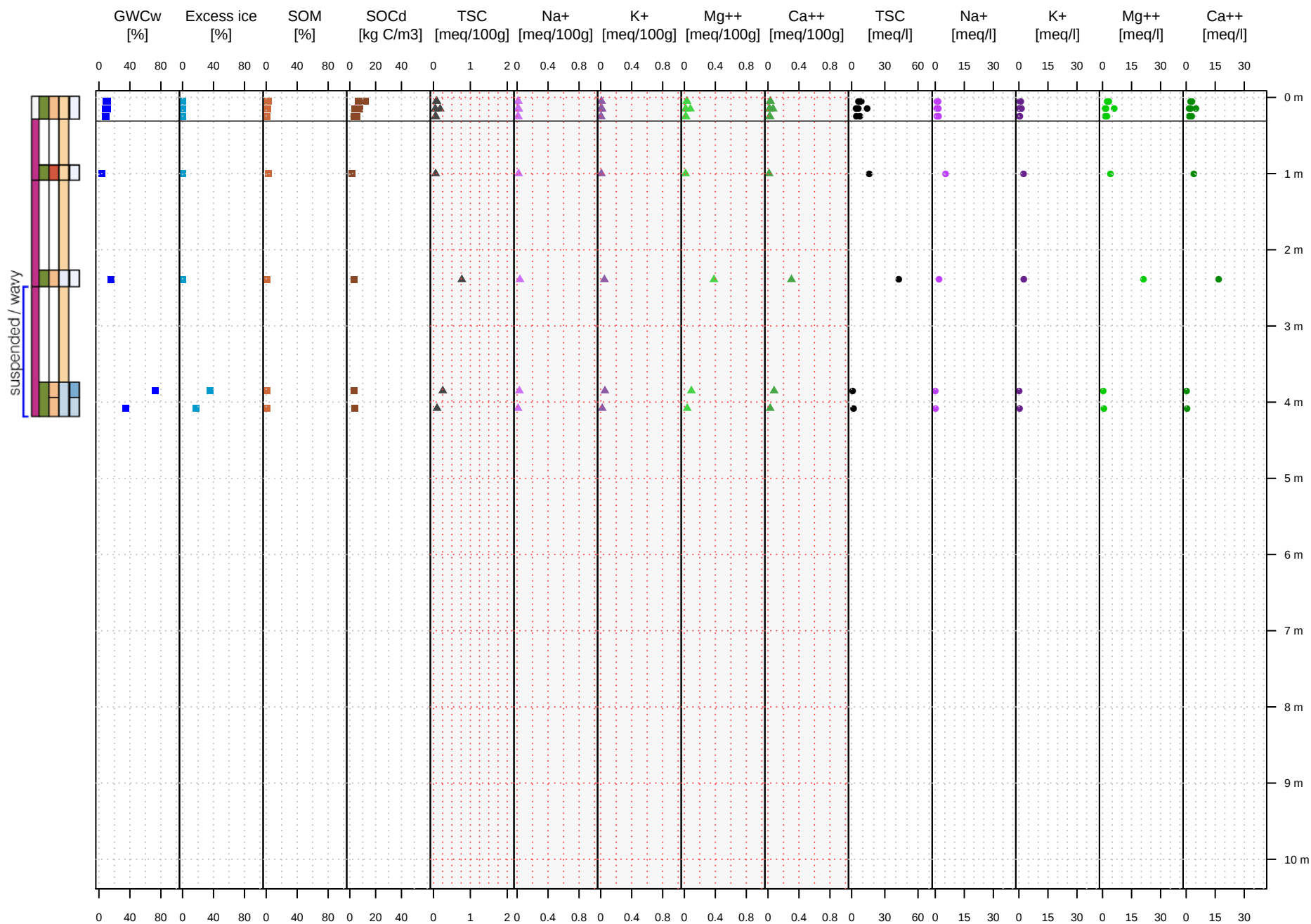
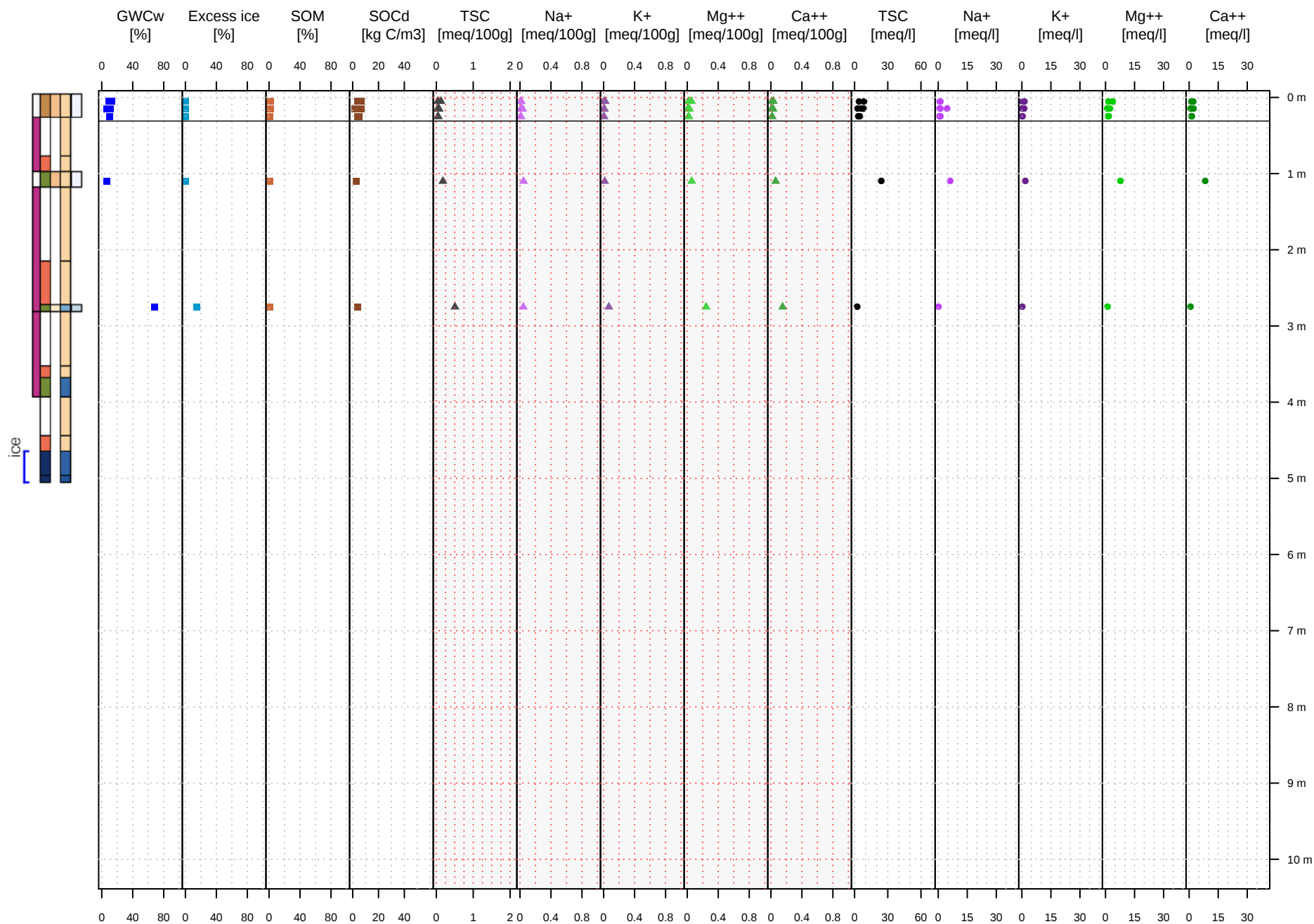


Figure S3 (Borehole NGO-DD15-2009). Analytical results [terrain type 'Upland till', sub type 'slope', surficial geology 1:125,000 map unit 'Th']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).



Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

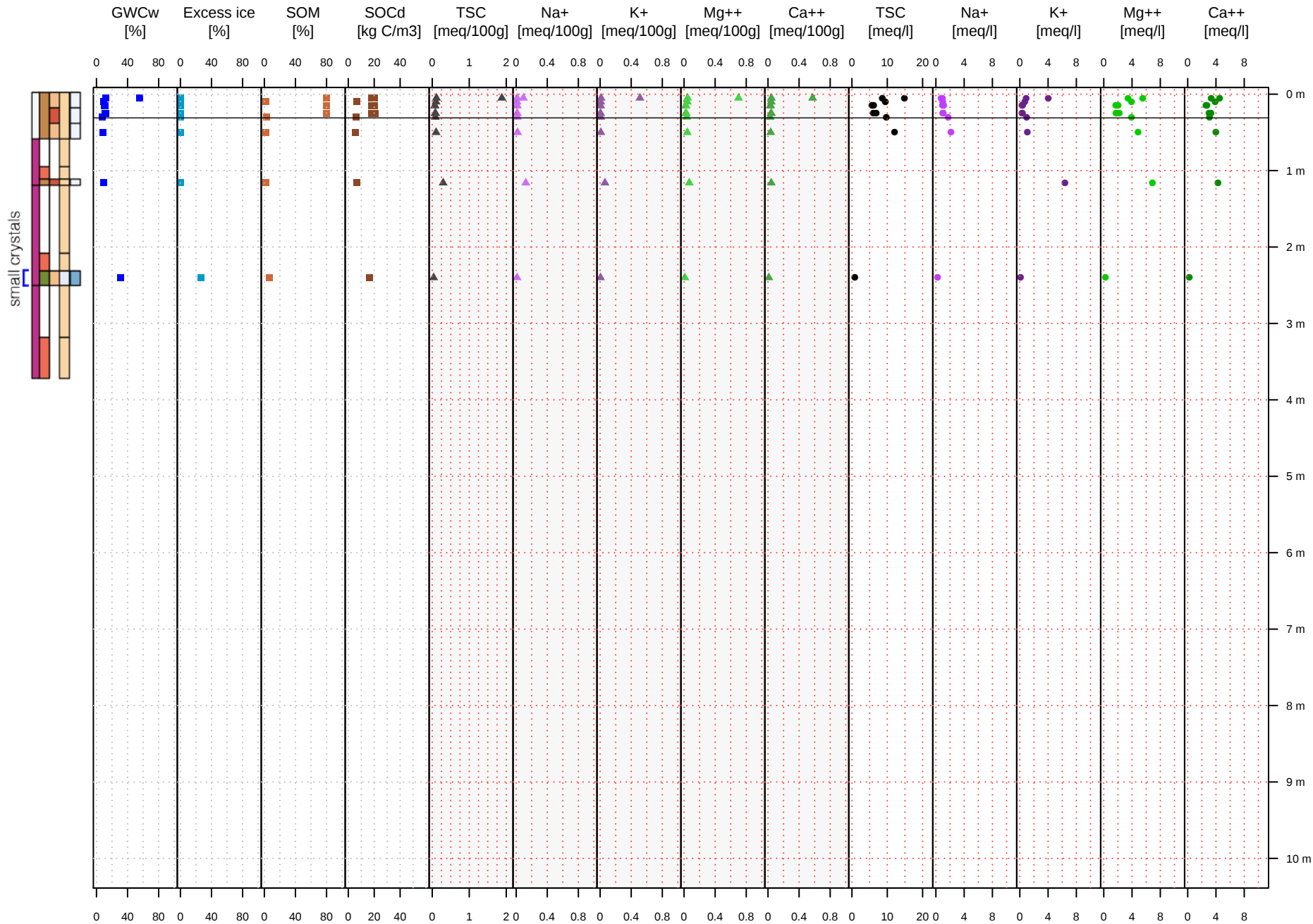


Figure S3 (Borehole NGO-DD15-1007). Analytical results [terrain type 'Upland till', sub type 'wet', surficial geology 1:125,000 map unit 'Th']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

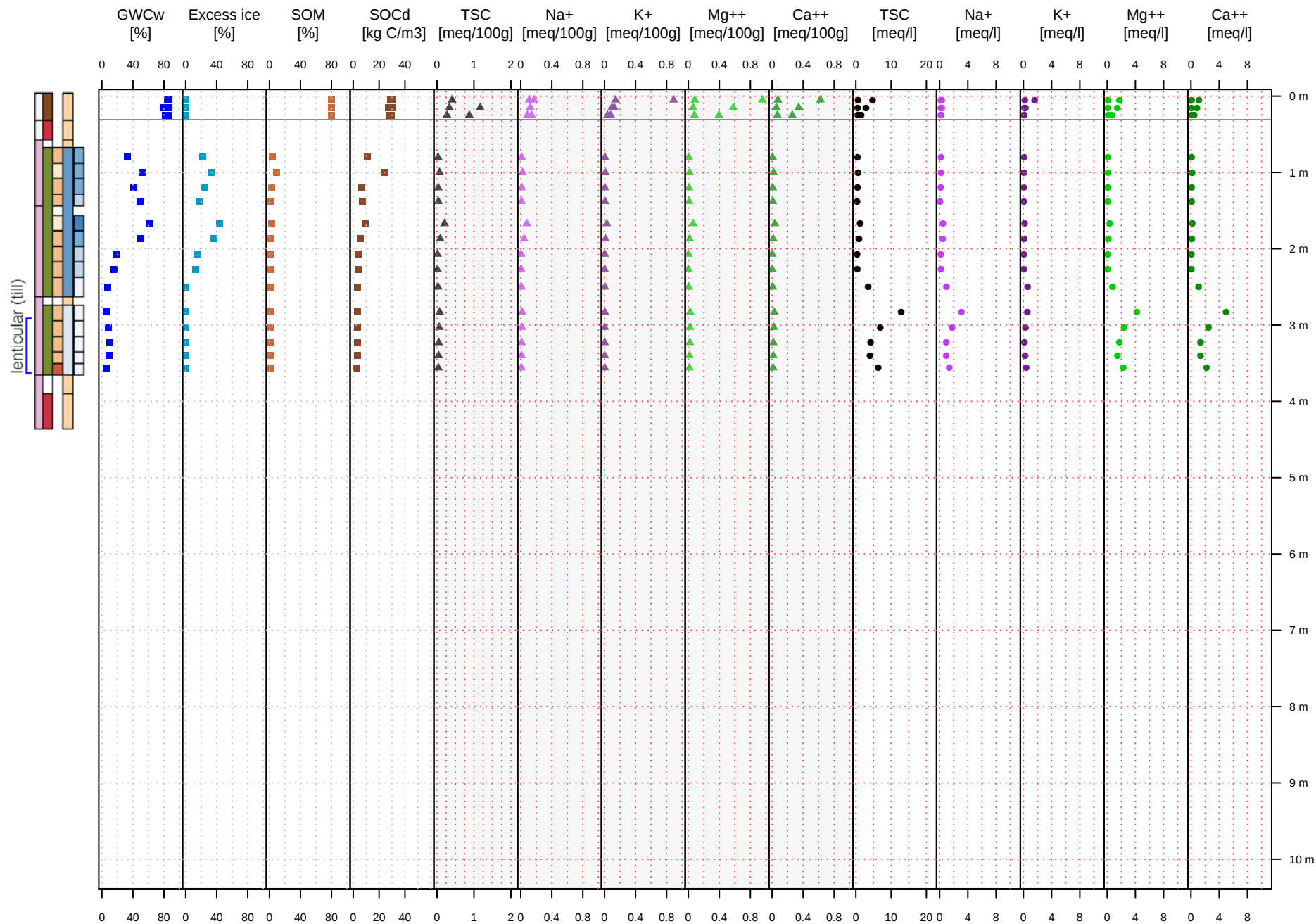


Figure S3 (Borehole NGO-DD15-1006). Analytical results [terrain type 'Organic', sub type 'wet', surficial geology 1:125,000 map unit 'Th']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

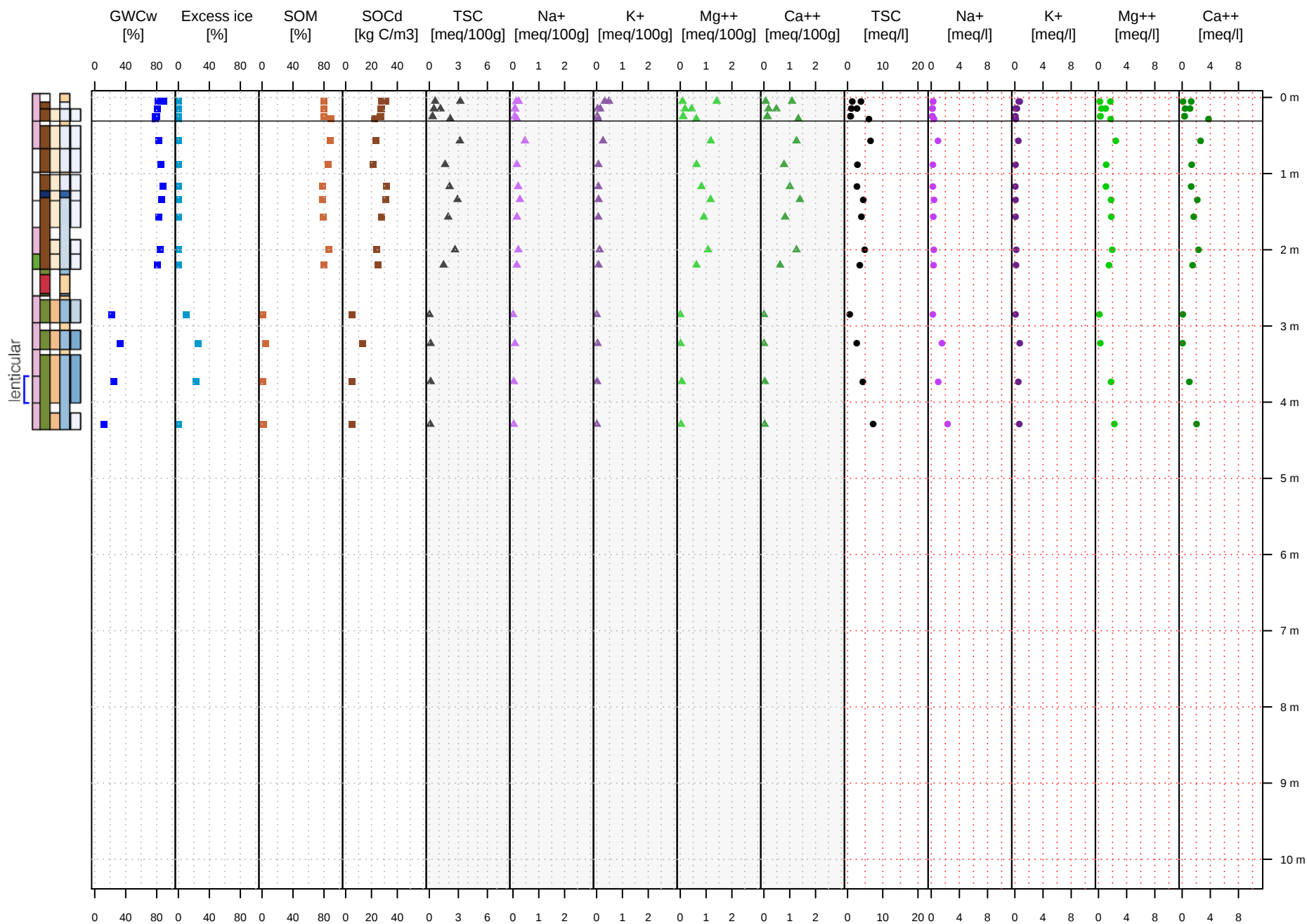
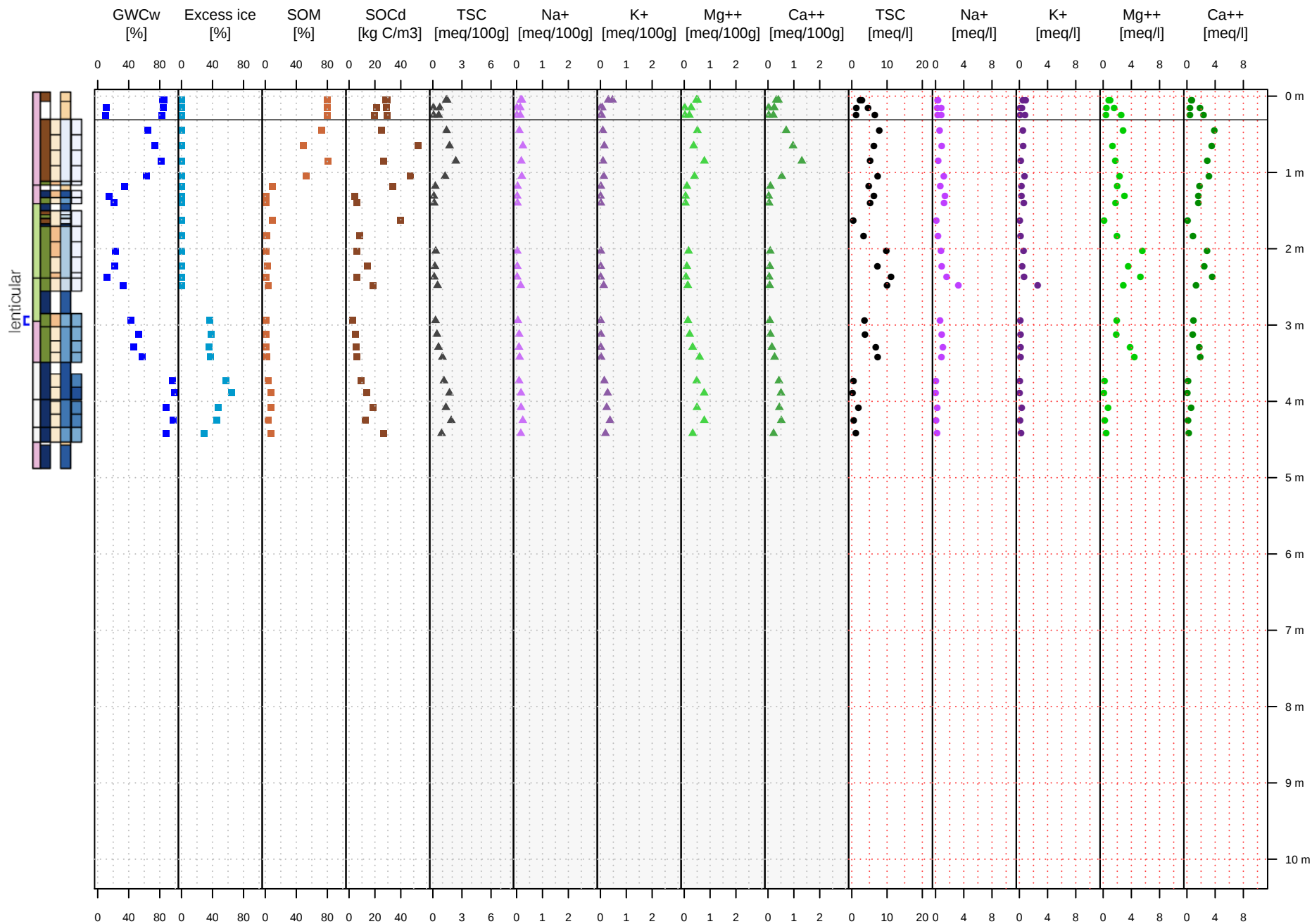


Figure S3 (Borehole NGO-DD15-1005). Analytical results [terrain type 'Organic', sub type 'wet', surficial geology 1:125,000 map unit 'Tv']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).



Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

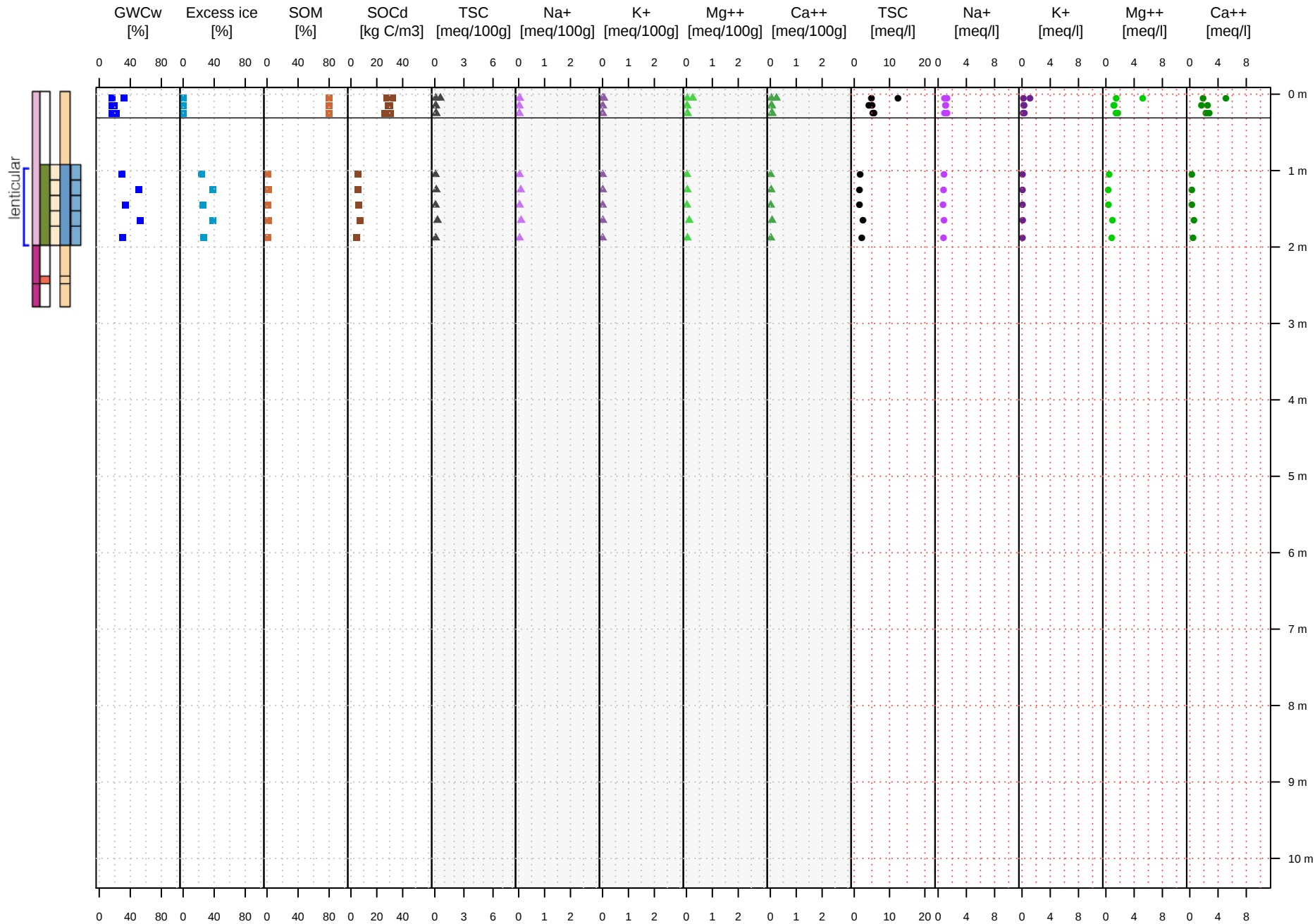


Figure S3 (Borehole NGO-DD15-2012). Analytical results [terrain type 'The Valley', sub type 'wet', surficial geology 1:125,000 map unit 'O']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

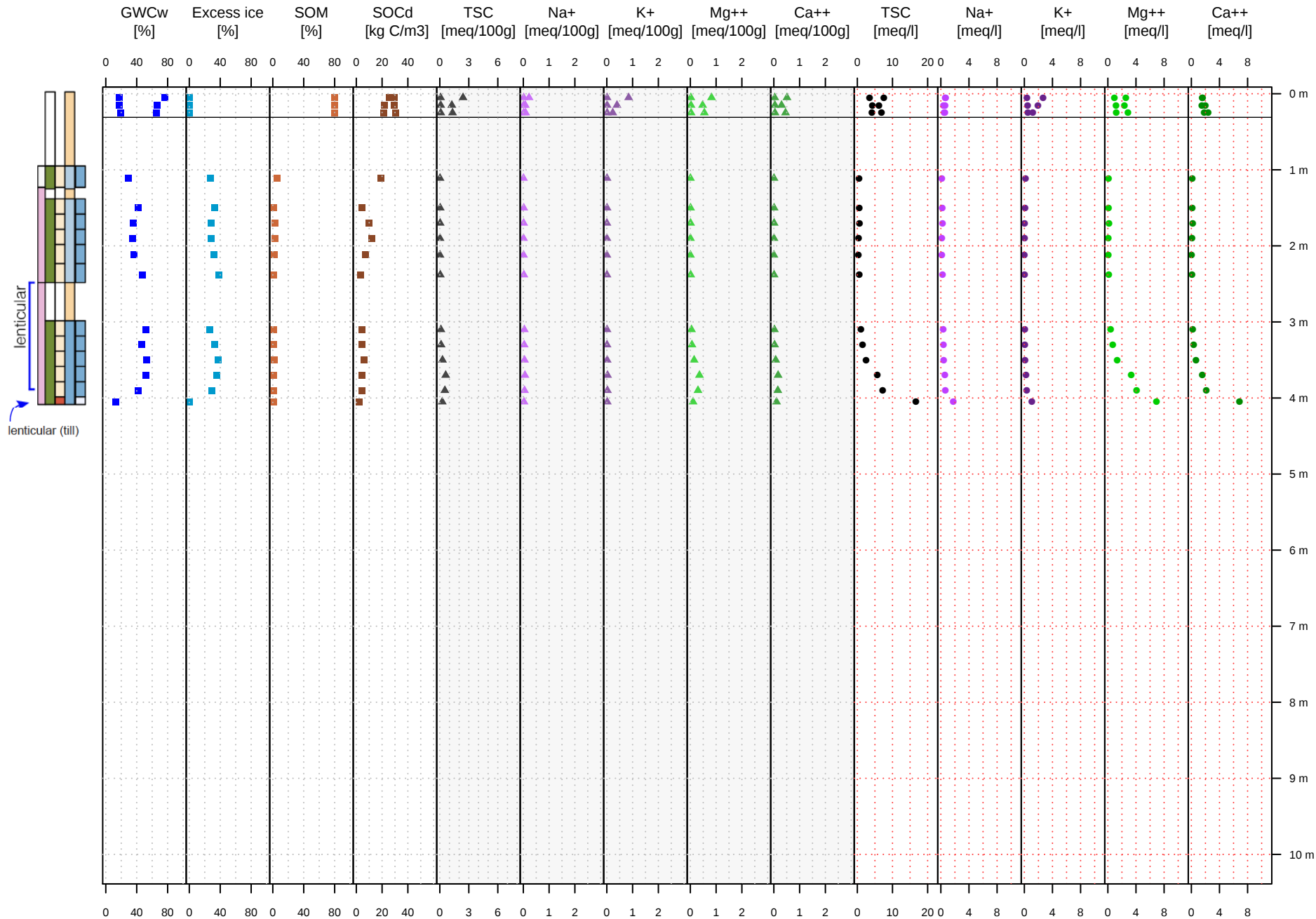


Figure S3 (Borehole NGO-DD15-2011). Analytical results [terrain type 'The Valley', sub type 'wet', surficial geology 1:125,000 map unit 'Tb']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

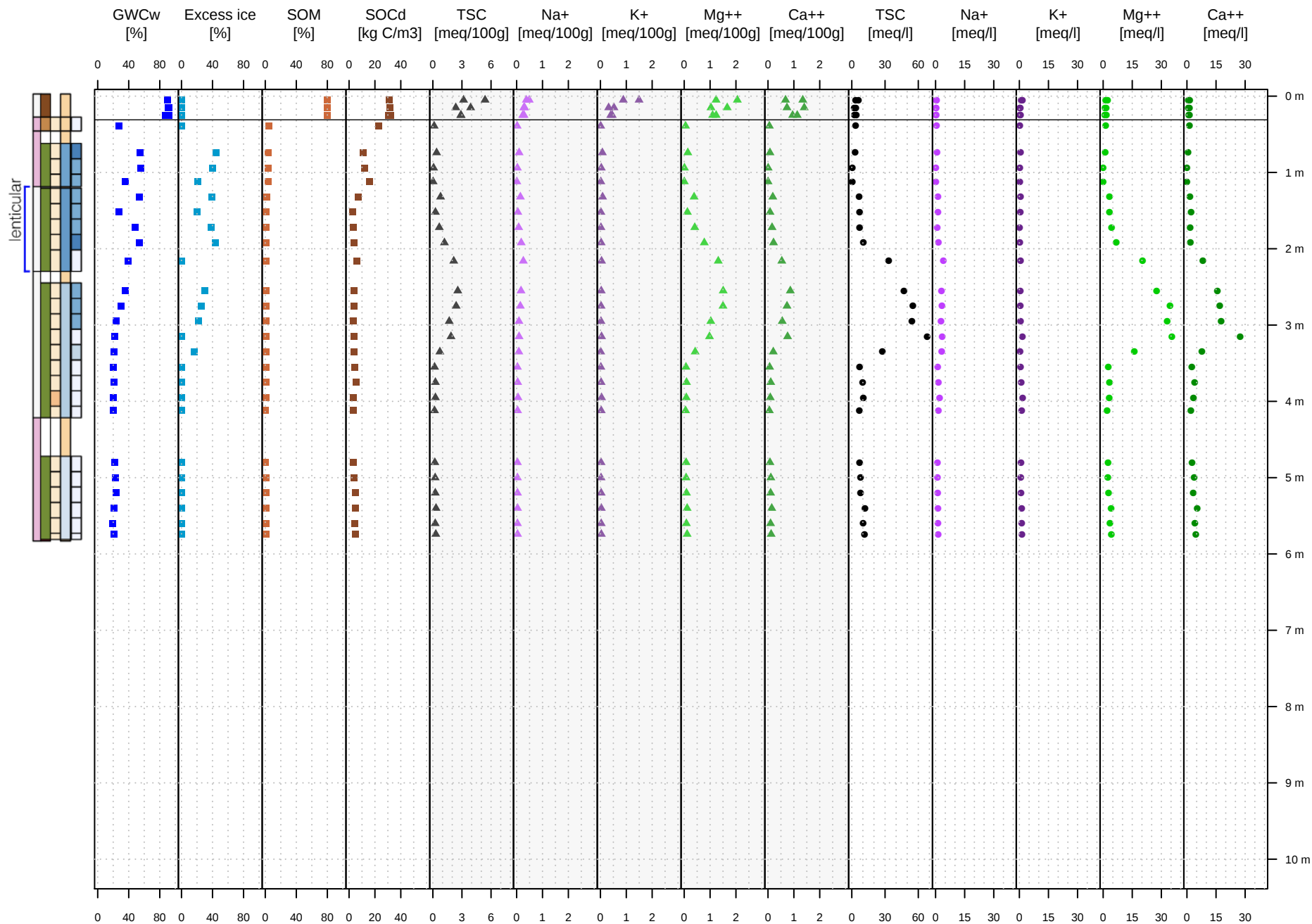


Figure S3 (Borehole NGO-DD15-1010). Analytical results [terrain type 'The Valley', sub type 'slope', surficial geology 1:125,000 map unit 'Tb']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

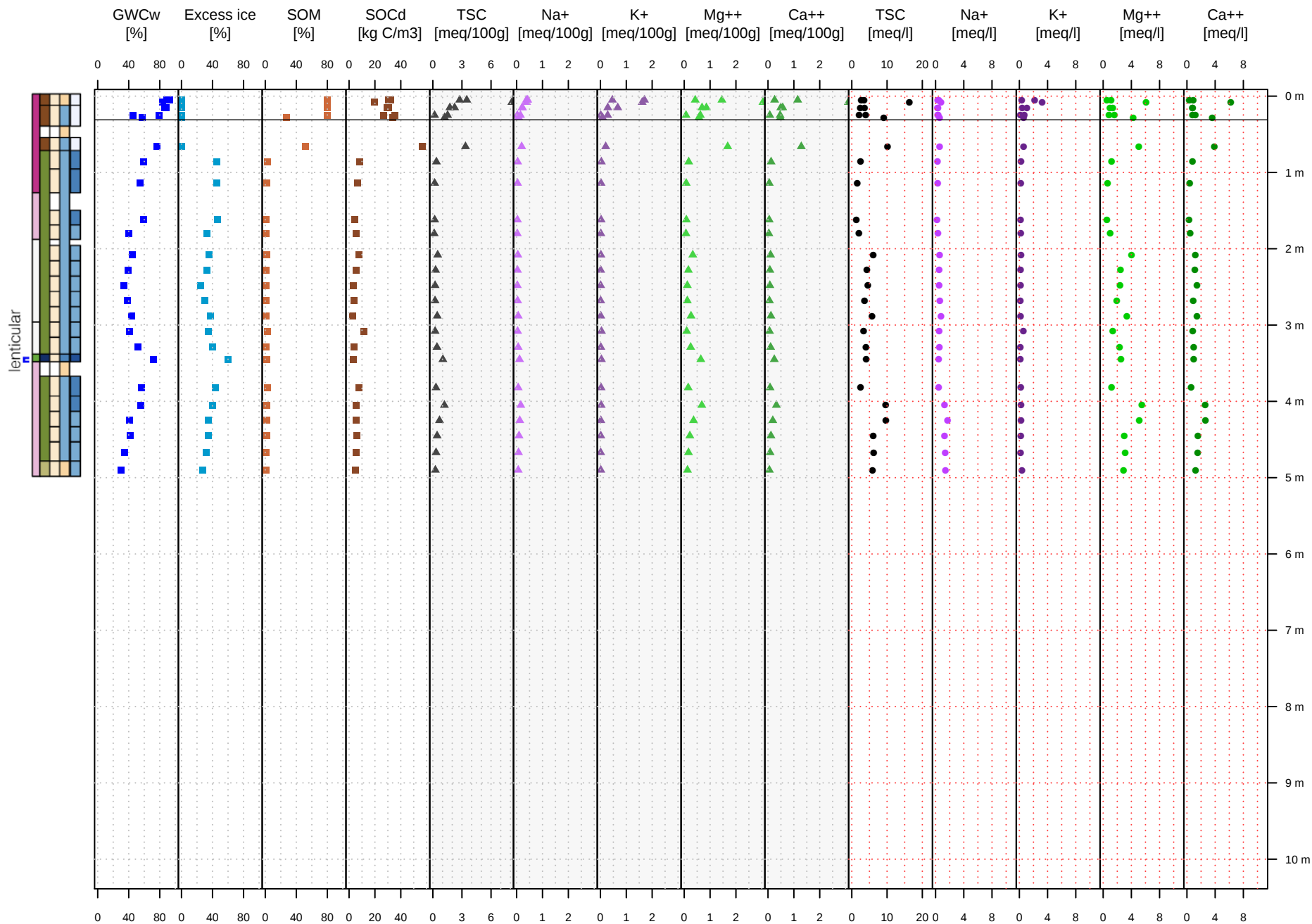


Figure S3 (Borehole NGO-DD15-1009). Analytical results [terrain type 'The Valley', sub type 'slope', surficial geology 1:125,000 map unit 'Tb']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

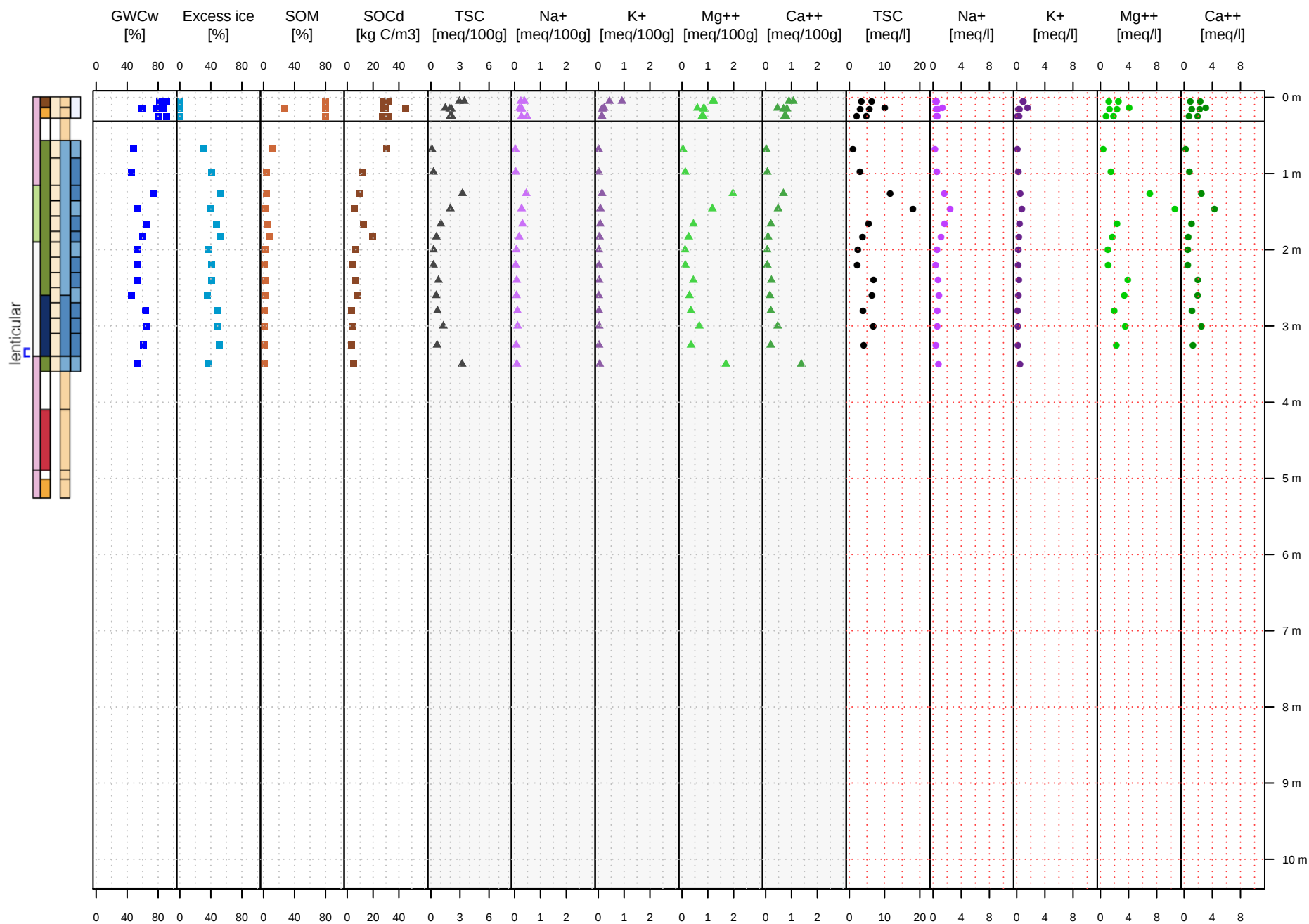


Figure S3 (Borehole NGO-DD15-2013). Analytical results [terrain type 'The Valley', sub type 'snow', surficial geology 1:125,000 map unit 'Tb']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

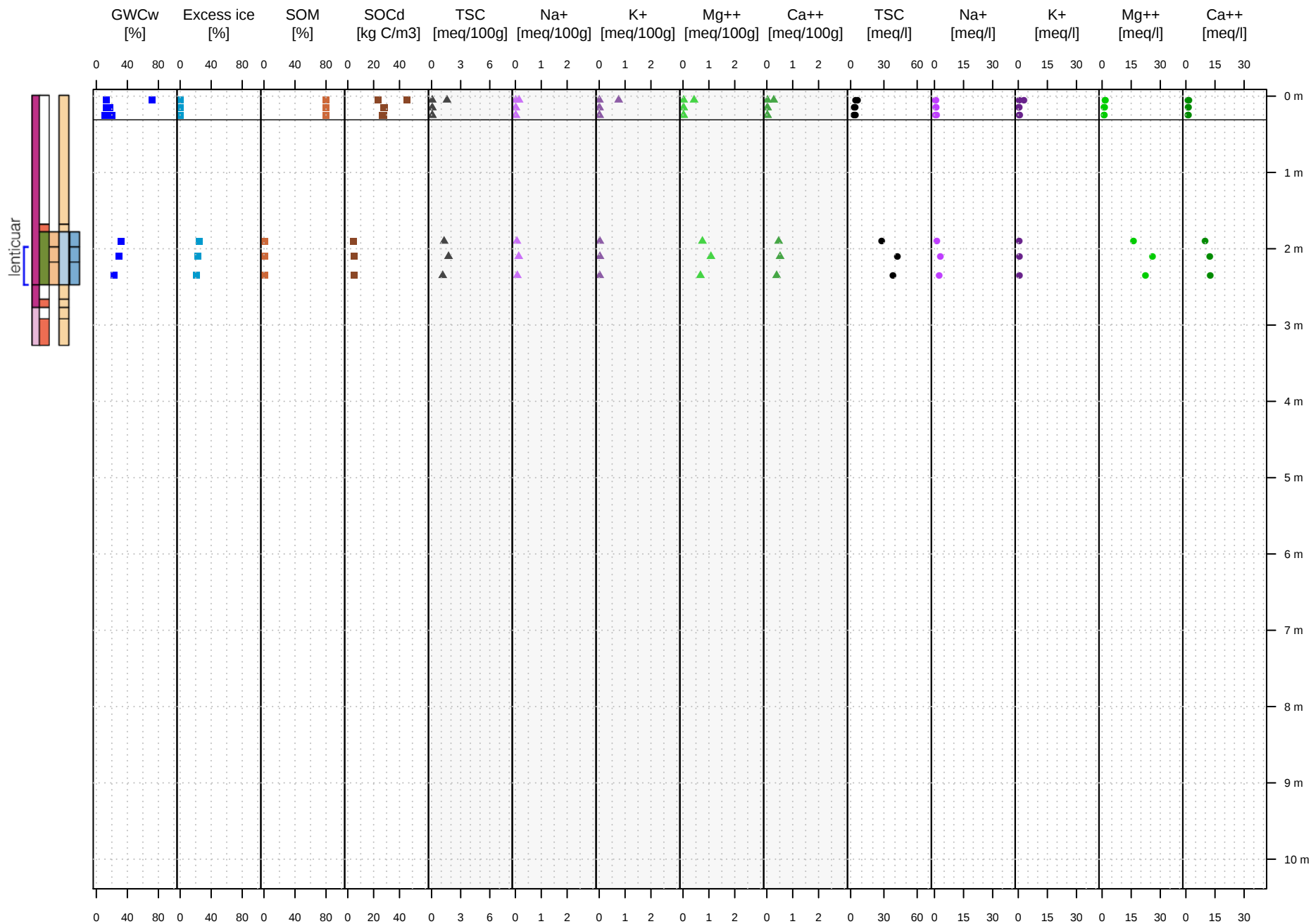
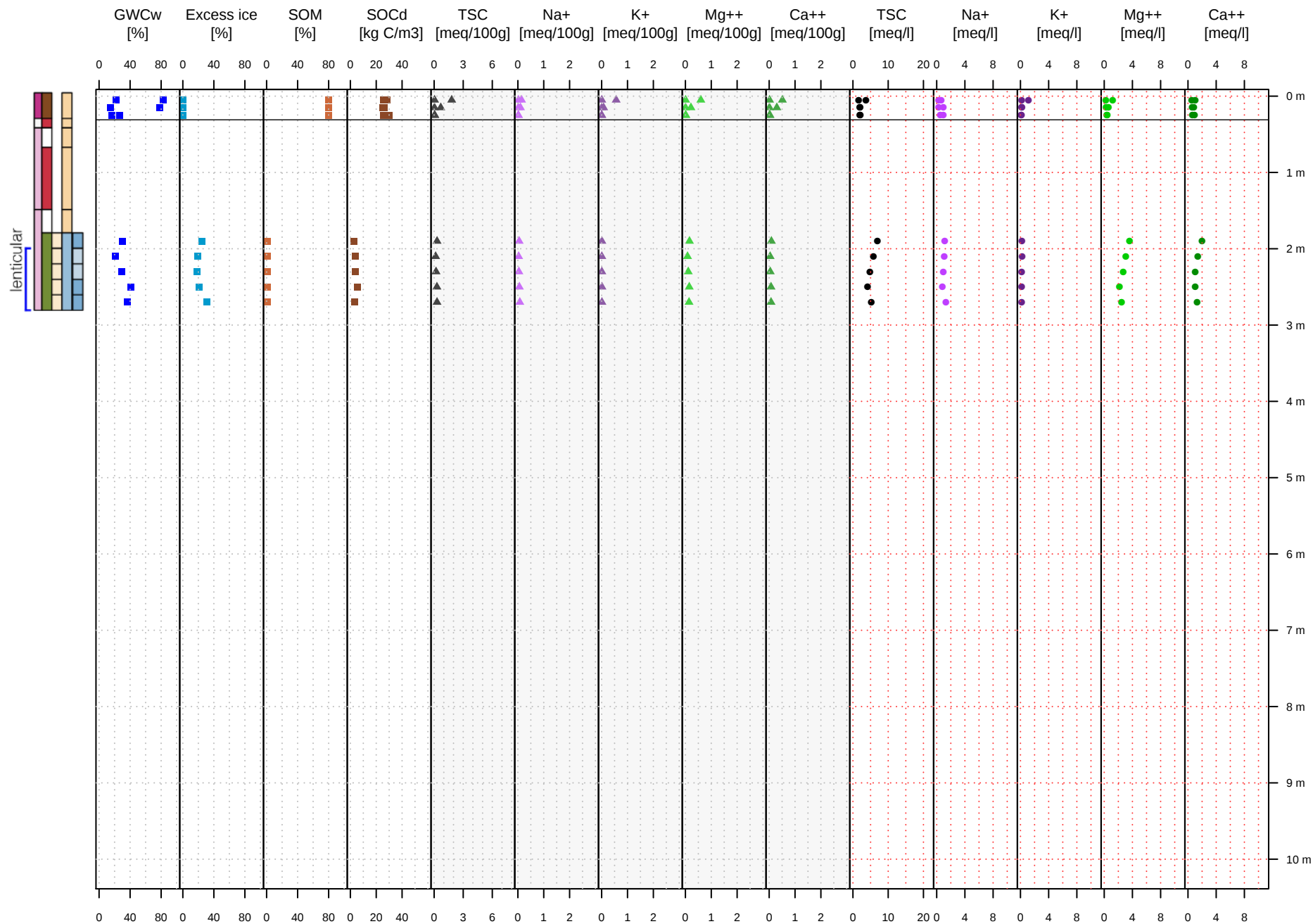


Figure S3 (Borehole NGO-DD15-2019). Analytical results [terrain type 'The Valley', sub type 'snow', surficial geology 1:125,000 map unit 'R2']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).



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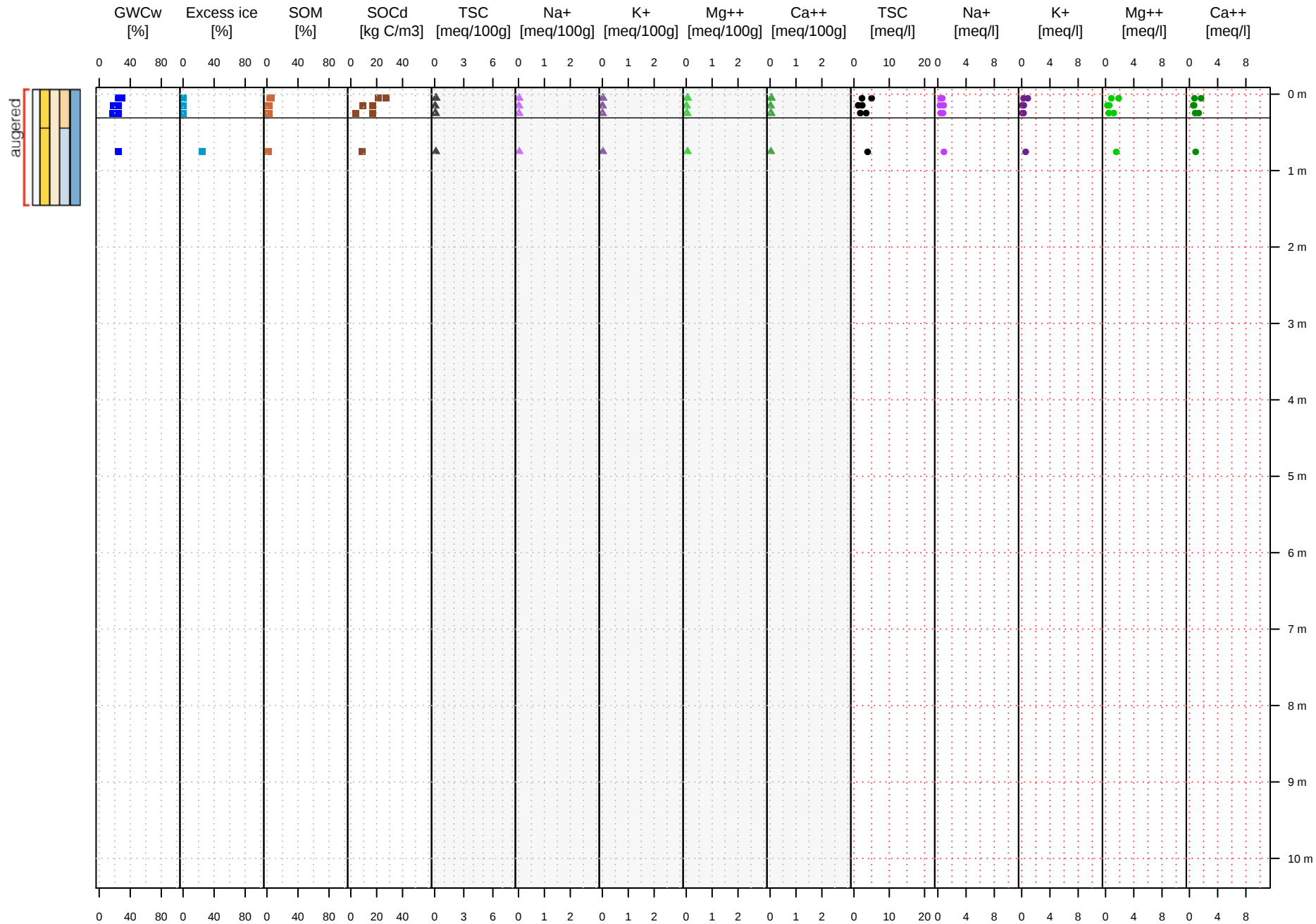
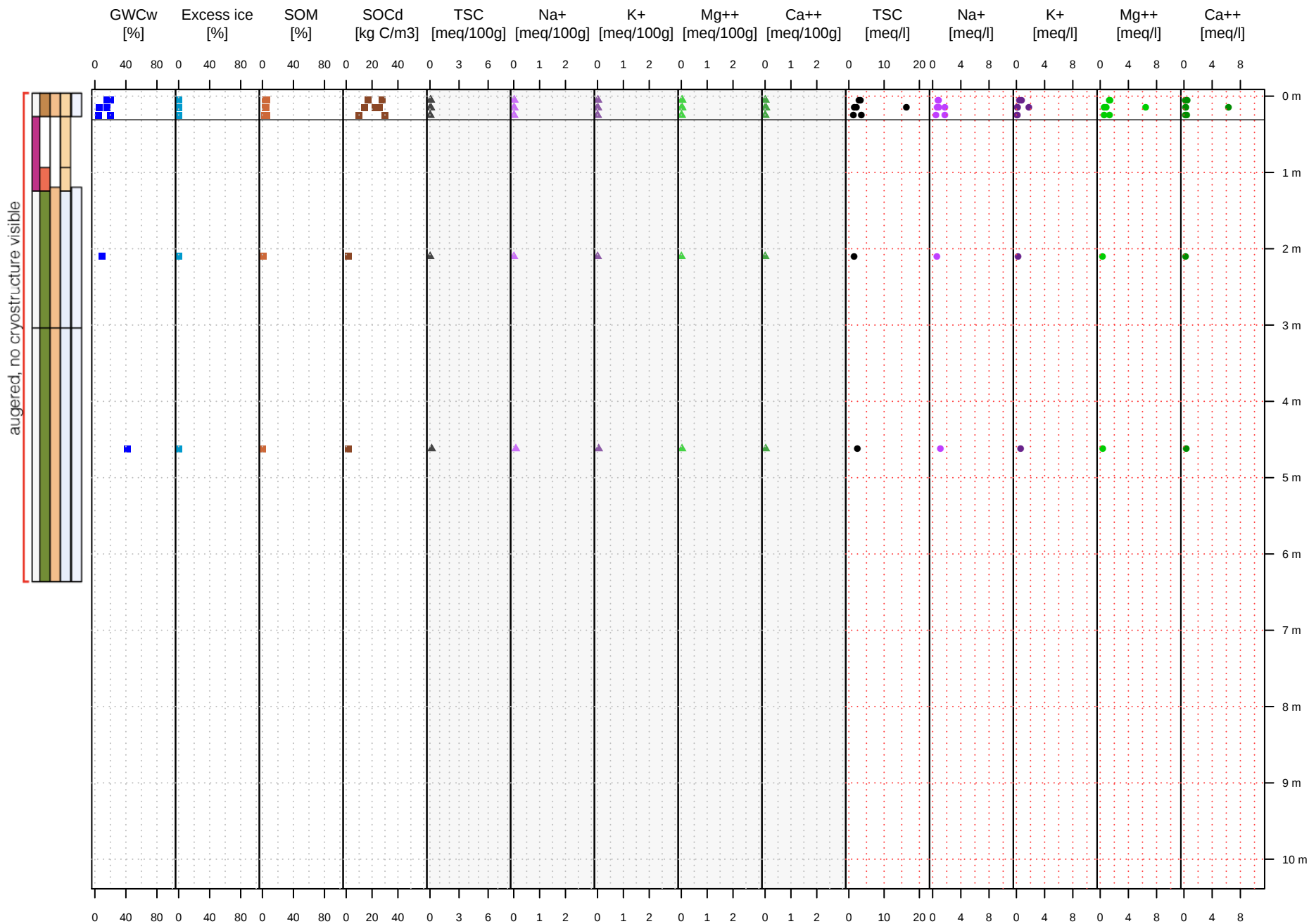


Figure S3 (Borehole NGO-DD15-2008). Analytical results [terrain type 'Esker', sub type 'top', surficial geology 1:125,000 map unit 'GFr']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).



Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

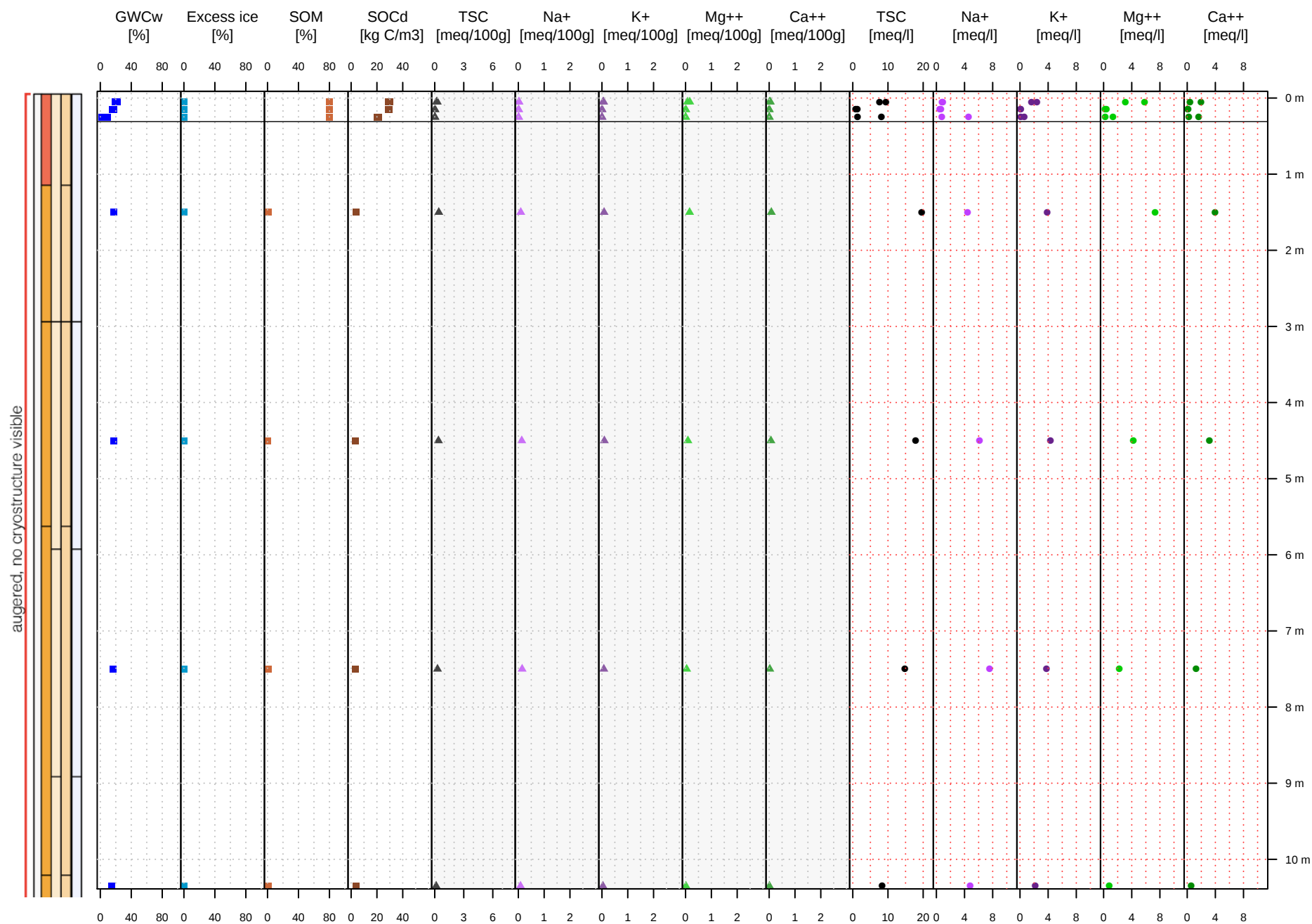


Figure S3 (Borehole NGO-DD15-2029). Analytical results [terrain type 'Esker', sub type 'top', surficial geology 1:125,000 map unit 'GFr']

Legend for drill log plot on the left is contained in Figure S2. Colour of grid lines distinguishes two levels of detail along x-axis for solutes: red (high) and black (low).

